What Is Claimed Is:

1. A method for quantifying a number of identical consecutive digits starting from a fixed position within a string of n digits, comprising:

converting the string of n digits into a thermometer code, wherein the thermometer code uses m bits to represent a string of m identical consecutive digits within the string of n digits;

converting the thermometer code into a one-hot code in which only one bit has a logical one value; and

converting the one-hot code into a logarithmic code representing the number of identical consecutive digits.

2. The method of claim 1, wherein converting the string of digits into the thermometer code involves passing the string of digits through $\lceil \log_2 n \rceil$ layers of AND gates, wherein a first layer of AND gates produces thermometer codes for sub-strings of length two, and wherein each consecutive layer produces thermometer codes for sub-strings of length k+1 to $2k$ by ANDing together thermometer codes for sub-strings of length 1 to k from preceding layers.

3. The method of claim 1,

wherein converting the thermometer code into the one-hot code involves passing the thermometer code through a single layer of two-input comparator gates;

wherein a given comparator gate produces a logical one value when a first input of the comparator gate receives a logical one value and a second input receives a logical zero value; and

wherein a comparator gate is coupled between each consecutive pair of thermometer code bits, so that only one comparator gate, covering a boundary between consecutive logical ones and consecutive logical zeros, produces a logical one value.

4. The method of claim 1, wherein converting the one-hot code into the logarithmic code involves passing the one-hot code through $\lceil \log_2 n \rceil - 1$ layers of OR gates, wherein a given bit in the logarithmic code is produced by ORing together bits of the one-hot code that cause the given bit in the logarithmic code to be asserted.

5. The method of claim 1, wherein the string of n digits is a string of n binary digits.

6. The method of claim 1, wherein the fixed position in the string of n digits is the beginning of the string, so that the number of leading identical consecutive digits is quantified.

7. The method of claim 6, wherein the number of leading zero values is quantified.

8. The method of claim 7, further comprising using the logarithmic code to normalize a result of a floating-point arithmetic operation.

9. The method of claim 1, further comprising using the logarithmic code to encode or decode a stream of data, wherein the logarithmic code represents a run-length of identical consecutive digits within the stream of data.

10. The method of claim 1, wherein each digit in the string of n digits includes one or more binary digits.

11. An apparatus that quantifies a number of identical consecutive digits starting from a fixed position within a string of n digits, comprising:

a thermometer code circuit that converts the string of n digits into a thermometer code, wherein the thermometer code uses m bits to represent a string of m identical consecutive digits within the string of n digits;

a one-hot code circuit that converts the thermometer code into a one-hot code in which only one bit has a logical one value; and

a logarithmic code circuit that converts the one-hot code into a logarithmic code representing the number of identical consecutive digits.

12. The apparatus of claim 11, wherein the thermometer code circuit includes $\lceil \log_2 n \rceil$ layers of AND gates, wherein a first layer of AND gates produces thermometer codes for sub-strings of length two, and wherein each consecutive layer produces thermometer codes for sub-strings of length k+1 to $2k$ by ANDing together thermometer codes for sub-strings of length 1 to k from preceding layers.

13. The apparatus of claim 11,

wherein the one-hot-code circuit includes a single layer of two-input comparator gates;

wherein a given comparator gate produces a logical one value when a first input of the comparator gate receives a logical one value and a second input receives a logical zero value; and

wherein a comparator gate is coupled between each consecutive pair of thermometer code bits, so that only one comparator gate, covering a boundary between consecutive logical ones and consecutive logical zeros, produces a logical one value.

14. The apparatus of claim 11, wherein the logarithmic code circuit includes $\lceil \log_2 n \rceil - 1$ layers of OR gates, wherein a given bit in the logarithmic code is produced by ORing together bits of the one-hot code that cause the given bit in the logarithmic code to be asserted.

15. The apparatus of claim 11, wherein the string of n digits is a string of n binary digits.

16. The apparatus of claim 11, wherein the fixed position in the string of n digits is the beginning of the string, so that the number of leading identical consecutive digits is quantified.

17. The apparatus of claim 16, wherein the apparatus quantifies the number of leading zero values.

18. The apparatus of claim 17, further comprising a floating-point arithmetic unit that is configured to use the logarithmic code to normalize a result of a floating-point arithmetic operation.

19. The apparatus of claim 11, further comprising an encoder that is configured to use the logarithmic code to encode or decode a stream of data,

wherein the logarithmic code represents a run-length of identical consecutive digits within the stream of data.

20. The apparatus of claim 11, wherein each digit in the string of *n* digits includes one or more binary digits.

21. A computer system including a circuit that quantifies a number of identical consecutive digits, comprising:

a processor;

a memory;

a quantifying circuit that quantifies the number of identical consecutive digits starting from a fixed position within a string of *n* digits, wherein the quantifying circuit includes,

a thermometer code circuit that converts the string of *n* digits into a thermometer code, wherein the thermometer code uses *m* bits to represent a string of *m* identical consecutive digits within the string of *n* digits;

a one-hot code circuit that converts the thermometer code into a one-hot code in which only one bit has a logical one value, and

a logarithmic code circuit that converts the one-hot code into a logarithmic code representing the number of identical consecutive digits.

22. The computer system of claim 21, further comprising:

a floating-point arithmetic unit of within the processor;

wherein the quantifying circuit is located within the floating-point arithmetic unit and is configured to normalize results of floating-point operations.

23. The computer system of claim 21,

wherein the computer system includes an encoding circuit for encoding or decoding streams of data; and

wherein the quantifying circuit is located within the encoding circuit and is configured to quantify run-lengths of identical consecutive digits for the encoding circuit.